

Remarks

Claims 2-4 and 6-26 are pending in the application. Claims 2, 3 and 6-26 are rejected under 35 U.S.C. § 102(b) as anticipated by Matsuoka and Weber. Claim 4 is rejected under 35 U.S.C. § 103(a) as unpatentable over Matsuoka in view of Sato. In view of the following remarks, reconsideration and withdrawal of these grounds of rejection is requested.

Examiner Interview

The Applicant thanks Examiner Figueroa for the courtesy of the Interview conducted on November 17, 2004. During the Interview, the Applicant's representative (Darius C. Gambino) and the Examiner discussed the prior art references of Matsuoka and Weber, and the drawing objections. Based on the Examiner's helpful comments, the present Amendment, which is deemed to overcome all objections and rejections, has been filed.

Drawings

Figure 4 is again objected to under 37 CFR 1.84(h)(1) as being an 'exploded' view not shown in brackets. The Applicant notes that Figure 4 is not an 'exploded' view; Figure 4 is a detail view of the connection point between two headers 410, 430, such as headers 210-240 shown in Figure 2. Accordingly, reconsideration and withdrawal of this objection is respectfully requested.

Figure 4 is additionally objected to under 37 CFR 1.83(a) as not showing a claimed element. The Examiner appears to object to Figure 4 for not showing the housings 410, 430 as

being “moveably connected” as specified in original claim 1 (now claim 7).

Although the Applicant disagrees with this characterization of Figure 4 (as highlighted in the Applicant’s response to the previous Office Action), the “moveably connected” language has been removed from claim 7, and Figure 4 has been amended. Thus, this ground of objection is deemed overcome.

Claim Rejections Under 35 U.S.C. § 102

Claims 2, 3, 6, 7 and 10-26 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Matsuoka (U.S. Pat. No. 5,443,404). Claim 3 has been canceled by this Amendment, and thus only claims 2, 6, 7 and 10-26 are at issue here. In view of the following remarks, reconsideration and withdrawal of this ground of rejection is respectfully requested.

The present invention comprises, in one exemplary embodiment, a pin header assembly 200 including headers 210, 220, 230 and 240 which are coupled together by male and female members disposed on the headers (See Fig. 2). The headers 210-240 each include contact pins 250 for creating an electrical contact with a PCB (See Fig. 3), and guide pins 260 for aligning the headers with the PCB. The PCB preferably includes vias 310 for receiving the contact pins 260, and mounting holes 320 for receiving the guide pins 260.

Figure 4 shows an exemplary assembly for coupling a first header 410 to a second header 430. In particular, the first header 410 includes a retention arm 420 which protrudes from the header and which includes a ridge 428. The second header 430 includes an opening 442 into which the retention arm 420 may be inserted. The opening 442 includes a ridge 448

corresponding to the ridge 428 on the retention arm 420 of the first header 410.

Independent claim 7 now recites:

A connector assembly comprising: a first housing having a retention arm, said retention arm including a longitudinal portion and a perpendicular portion, said perpendicular portion including a first ridge; and a second housing having an opening for receiving the retention arm, said second housing including a second ridge within the opening, wherein the first ridge and the second ridge engage one another to hold the retention arm in the opening, wherein the first housing and the second housing each have a lower side for connecting to a printed circuit board (PCB), wherein at least one of the lower sides includes guide pins for aligning the first housing and the second housing with the PCB; and, wherein the retention arm can move longitudinally within the opening from a point where the first ridge and the second ridge engage to a point where the retention arm abuts an end of the opening so as to ensure the proper alignment of the guide pins with the PCB.

Thus, claim 7 now requires an assembly including a “first housing” including a “retention arm” with a “longitudinal portion” and a “perpendicular portion...including a first ridge”, and a “second housing” including a “second ridge” disposed within an “opening,” such that first and second housings can move longitudinally with respect to one another to ensure the proper alignment of “guide pins” with a Printed Circuit Board (PCB). As discussed below, Matsuoka fails to disclose or suggest such an invention.

Matsuoka teaches a plurality of sockets 2 arranged on a wiring board 7, and coupled together by the interaction of an engagement piece 11 (on a first socket 2) with a clearance 9 (on a second socket 2) (See Figs. 4 and 5). A lower surface of the sockets 2 include male terminals 4a for insertion into through-holes 13 in the wiring board 7. When the male terminals 4a are so inserted (and subsequently soldered), an electrical connection is formed between the wiring

board 7 and the respective socket 2 (emphasis added).

Matsuoka fails to disclose, teach or suggest an assembly including “guide pins,” as previously recited in claim 7. Matsuoka only discloses male terminals 4a which are inserted into a wiring board 7. Even if, *arguendo*, these male terminals 4a are viewed so as to correspond to the “contact pins” recited in claim 6, there is no element of Matsuoka which could correspond to the “guide pins” recited in claim 6.

Moreover, Matsuoka fails to disclose, teach or suggest an assembly including a “first housing” including a “retention arm” with a “longitudinal portion” and a “perpendicular portion...including a first ridge”, and a “second housing” including a “second ridge” disposed within an “opening,” such that first and second housings can move longitudinally with respect to one another to ensure the proper alignment of the “guide pins” with a PCB, as now recited in independent claim 7. Accordingly, reconsideration and withdrawal of this rejection with respect to claims 2, 6, 10 and 11 is respectfully requested.

Similar to independent claim 7, independent claims 12, 15 and 18 now include limitations requiring an assembly including a “first housing” including a “retention arm” with a “longitudinal portion” and a “perpendicular portion...including a first ridge”, and a “second housing” including a “second ridge” disposed within an “opening,” such that first and second housings can move longitudinally with respect to one another to ensure the proper alignment of “guide pins” with a PCB. Hence, for at least those reasons discussed above with respect to claim 7, reconsideration and withdrawal of this ground of rejection with respect to claims 12-26 is also respectfully requested.

Claims 3, 6-9, 11-13 and 15-17 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Weber et al. (U.S. Pat. No. 4,790,763). Claim 3 has been canceled by this Amendment, and thus only claims 6, 8, 9, 11-13 and 15-17 are at issue here. In view of the following remarks, reconsideration and withdrawal of this ground of rejection is respectfully requested.

Weber teaches a connector assembly 10, 10' for coupling a mother circuit board M to a daughter circuit board DA (See Fig. 1A). The mother board assembly 10 includes, for example, modules E and F which may be coupled to each other by means of housing members 26, 28 disposed on the module F, and corresponding projection 46 on the module E (See Fig. 2). The module F also includes a (male) projection 22 which may be aligned with a (female) socket 42 to assist in mating the modules. Aligned posts 70 extend from the module F for providing an electrical connection to the mother board M.

Weber also teaches projections 12, 12' which are "integral with housings of the modules, and which fit within holes within the printed circuit boards (see, col. 4, lines 21-25)." In particular, projection 12 extends from Module A and fits within a hole in the mother board M (See Fig. 1B), and projection 12' extends from Module A' and fits within a hole in the daughter board DA (See Fig. 1C). The projections 12, 12' are to "hold the modular connector assembly half (e.g., Modules A-G) in position prior to soldering..." (see, col. 4, lines 25-27).

Weber fails to disclose, teach or suggest an assembly including a "first housing" including a "retention arm" with a "longitudinal portion" and a "perpendicular portion...including a first ridge", and a "second housing" including a "second ridge" disposed

within an “opening,” such that first and second housings can move longitudinally with respect to one another to ensure the proper alignment of “guide pins” with a PCB, as now recited in independent claim 7.

Weber does not permit any of the Modules A-G or A'-G' to move longitudinally with respect to one another to ensure proper alignment with the respective mother (M) and daughter (DA) boards (i.e., Module E cannot move longitudinally with respect to Module F, once they are coupled together). Weber relies on the projections 12, 12' alone to align the entire set of modules A-G or A'-G' with the respective printed circuit board (i.e., M or DA). As will be noted from a review of Figures 1A and 2 of Weber, the Modules A-G and A'-G' are tightly coupled to one another, leaving no room for longitudinal movement. In fact, it is this tight coupling which permits the projections 12, 12' alone to provide for alignment of the composite module assemblies (e.g., composite assembly including Modules A-G, composite assembly including Modules A'-G') with the circuit boards M and DA. If the Modules A-G and A'-G' were more loosely coupled (as the modules 210-240 are in the present invention), they would not properly align with the circuit boards M and DA. This proves that Weber actually ‘teaches away’ from the present invention. Therefore, for the reasons noted above, reconsideration and withdrawal of this ground of rejection with respect to claims 1, 6-9 and 11 is respectfully requested.

Similar to independent claim 7, independent claims 12 and 15 now include limitations requiring an assembly including a “first housing” including a “retention arm” with a “longitudinal portion” and a “perpendicular portion...including a first ridge”, and a “second housing” including a “second ridge” disposed within an “opening,” such that first and second

housings can move longitudinally with respect to one another to ensure the proper alignment of “guide pins” with a PCB. Hence, for at least those reasons discussed above with respect to claim 7, reconsideration and withdrawal of this ground of rejection with respect to claims 12, 13 and 15-17 is also respectfully requested.

Claim Rejections Under 35 U.S.C. § 103

Claim 4 stands rejected under 35 U.S.C. § 103(a) as being obvious over Matsuoka in view of Sato (U.S. Pat. No. 6,343,959). Claim 4 has been canceled by this Amendment and the limitations thereof incorporated into independent claim 7. Accordingly, reconsideration and withdrawal of this ground of rejection is respectfully requested.

Sato teaches a connector assembly including an upper housing 11A and a lower housing 11B stacked on top of one another in a vertical direction. The upper and lower housings 11A and 11B include lock claws 12 at upper faces thereof, and lock claws 13 at lower faces thereof. The lock claws 12 include stepped parts 12a, and the lock claws 13 include stepped parts 13a. As shown in Figures 1A-1C, the lock claws 12 of the upper housing 11A engage the lock claws 13 of the lower housing 11B when the upper housing is stacked in top of the lower housing.

Neither Matsuoka nor Sato discloses, teaches or suggests an assembly including a “first housing” including a “retention arm” with a “longitudinal portion” and a “perpendicular portion...including a first ridge”, and a “second housing” including a “second ridge” disposed within an “opening,” such that first and second housings can move longitudinally with respect to

one another to ensure the proper alignment of “guide pins” with a PCB.

As discussed above, Matsuoka fails to disclose, teach or suggest “guide pins” and first and second housings which are movable longitudinally with respect to one another to ensure the proper alignment of the “guide pins” with a PCB, as now recited in claim 7. Sato also fails to disclose, teach or suggest such an invention. All that Sato teaches is a connector assembly which includes lock claws 12 and 13 on each housing (11A, 11B) of the assembly.

Moreover, it would not have been obvious to one of ordinary skill in the art to replace the engagement elements 8a, 8b shown in Figures 4 and 5 of Matsuoka with the lock claws 12, 13 shown in Sato, as the socket bodies 2 in Matsuoka are disposed horizontally with respect to one another (See Fig. 3 of Matsuoka), and the housings 11A, 11B of Sato are stacked vertically (See Figs. 1A, 1B of Sato). These differing layouts clearly dictate different considerations in the connection of the individual housing members to one another. The replacement of the engagement elements 8a, 8b of Matsuoka with the lock claws 12, 13 shown of Sato would clearly create the need for additional engineering changes which would lead one of ordinary skill in the art away from such a modification.

Therefore, for those reasons discussed above, reconsideration and withdrawal of this ground of rejection is respectfully requested.

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Conclusion

In view of the foregoing remarks, Applicants submit that this application is in condition for allowance at an early date, which action is earnestly solicited.

Respectfully submitted,



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In the Drawings

Applicant submits herewith a revised version of Figure 4. Consideration and approval of the drawing changes to Figure 4 are respectfully requested.